

## THE PROPHLIANTIDAE

### A PROPOSED NEW FAMILY OF AMPHIPODA, WITH DESCRIPTION OF A NEW GENUS AND FOUR NEW SPECIES

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Text-figs. 1-10.

THE discovery, in the collection of Amphipods brought back in 1914 by the "Aurora" from Macquarie Island of a new genus *Cylindryllioides* (1938), closely akin to *Bircenna*, revived the question of the systematic position of the latter genus.

Erected by Chilton, in 1883, for a single New Zealand species (*Bircenna fulva*), that author remarked: "I do not know where to place this peculiar-looking Amphipod; it may come near to *Phlias*, but the species of that genus . . . are not described in sufficient detail to warrant one in forming any definite conclusion as to their relationship."

Chilton's original account, which was very brief, unfortunately inaccurately recorded the telson as "simple, not divided". While this may or may not have influenced Stebbing in assigning *Bircenna* (in "Das Tierreich", 1906) to the Phliantidae, it was, almost certainly, responsible for Chevreux's proposal of a new genus *Wandelia* (1906) for a subantarctic species which was referred to the Phliantidae (Phliasidae), and was said to differ from *Bircenna* notably in that the telson was completely cleft.

In 1903 another peculiar Amphipod was recorded by Walker. He placed it in a new genus, *Kuria*, noted its resemblance in many particulars to *Bircenna*, called attention to its cleft telson, questioned the propriety of the reference of such forms to the Phliantidae, and finally left it *incertae sedis*. Stebbing, in 1906, included it in the Phliantidae.

Chilton (1909) having re-examined *Bircenna fulva*, recognized the error in his description of the telson, and correctly described it as "split to the base". He went further, and concluded that "*Wandelia* is identical with *Bircenna*, and, indeed, *Wandelia crassipes* is specifically not very different from *Bircenna fulva*".

Chilton, however, in his examination of *Bircenna fulva*, completely overlooked one very curious and indeed unique character in that genus, viz. the occurrence of a deep and strongly curved transverse plate projecting ventrally like a

collar, from the under surface of the first peraeon segment (fig. 7 A). It is obviously a development of the sternite of that segment, and may be referred to as the *ventral flange*. I find this present in all undoubted species of *Bircenna*, and consider it a character of generic importance.

In the Western Australian species *B. ignea*, described below, this semi-circular flange extends sufficiently far forward to actually underlie the base of the head, its anterior surface being strongly concave, bounding a watch-pocket shaped recess.

In the South Australian species, *B. nicholli* Sheard, and in the New Zealand *B. fulva* Chilton, it is, perhaps not quite so strongly developed, but is, nevertheless, a quite conspicuous feature.

In most of the members of this group of genera there is an unusually long articular region, or "neck", separating the head from the peraeon, but the head can be strongly retracted, in which case its lower surface and the hinder mouth parts are, in *Bircenna*, partly received in this pocket. In the genus *Eophliantis*, recently established by Sheard, as well as in *Cylindryllioides*, this structure is absent, nor can I find it in any of the new species *Prophlias anomalus*, *Biancolina australis* and *Wandelia japonensis*.

The specimens of *Wandelia crassipes* examined by Chevreux were smaller than fully-grown *B. fulva*, and correspondingly more difficult to study, yet since Chevreux correctly recorded the cleft condition of the telson of his species, I cannot believe that he would have overlooked the above quite conspicuous sternal development had it been present. Indeed, his figure certainly suggests its absence, and for this reason I consider that *Wandelia* must be retained as a distinct genus, related much more closely to *Eophliantis* than to *Bircenna*.

In his "Note on the Amphipodan genera, *Bircenna*, *Kuria*, and *Wandelia*", Chilton (1909), while amending his account of *Bircenna* and proposing the abandonment of *Wandelia*, recognized that, in the completely cleft condition of the telson, this genus and *Kuria* differed from all the remaining Phliantidae known at that time. A further difference is found in that all the then remaining genera (*Iphinotus*, *Pereionotus*, etc.) are markedly dorso-ventrally flattened. Indeed, in their appearance, they are utterly unlike the cylindriform *Bircenna*.

He hesitated, however, at the obvious step of establishing another family, and suggested, instead, the enlargement of the characters of the Phliantidae to accommodate these very dissimilar forms—but omitted to formulate the suitably modified family diagnosis he recommended.

Recently Sheard has tentatively proposed the division of the Phliantidae into two subfamilies, which he named respectively the *Eophliantinae* and the *Phliantinae*.

Classification must be, to a considerable extent, a matter of convenience, and the separation of these genera into two subfamilies does not completely meet the case. That they are not very distantly related may be at once conceded, but that is true of many accepted Amphipodan families.

Since there are now recorded no fewer than eight genera of this cylindroidal or compressed Amphipodan type, with telson cleft more or less completely, it seems reasonable to establish for them a distinct family, for which the name *Prophliantidae* is suggested, the depressed forms with entire telson constituting the Phliantidae.

Of these genera one, *Prophlias*, is new. In some particulars it seems least specialized, and, in these, probably comes nearest to the condition of the ancestral forms of both the Prophliantidae and of the Phliantidae: there is something about it curiously suggestive of the Lysianassidae. In other characters it is quite unusual, in many linking up with *Kuria*. It is represented by a single species *P. anomalus* n. sp.

As regards *Biancolina*, it seems extremely probable that under the name *B. cuniculus*, Stebbing (1906) has united two entirely distinct forms, and, while his species may well prove to be correctly referred to the Ampithoidae, *Biancolina algicola* Della Valle should, in my opinion, be removed from that family. With the new Western Australian Amphipod described under the name *B. australis*, it is here included in the Prophliantidae.

A third species of *Bircenna*, *B. ignea* n. sp., also from Western Australia, is here named and described.

The distribution of the species, at present recorded, is mainly Australasian, eight out of the twelve (or perhaps thirteen) occurring in that area; the remaining four (or five) consisting of one of the two *Biancolina* spp. (Mediterranean) *Wandelia*, with one sub-antarctic American and one Japanese species, and *Kuria* from the neighbourhood of Sokotra. If the *Ceina* sp. taken by the Siboga Expedition near Suhi, proves to be actually identical with *C. egregia* (Chilton) it will be the only example of wide distribution of a species.

All species, however, are very small, and, from the nature of their habitat, likely to be taken only by chance; they seem never to have been secured except in small numbers. It is probable that careful search will reveal the family to be of very wide occurrence.

I desire to take this opportunity of recording my thanks to Mr. K. Sheard, of the South Australian Museum, for facilitating my examination of the material in that Collection, as well as for help in several other ways, not least of these being the undertaking to see the paper through the press; also, in acknowledging my indebtedness to Dr. A. G. Nicholls for his assistance in the making of the prepara-

tions required, and of the camera lucida drawings from which the illustrations have been made.

NOTE.—The term *parachelate* is proposed for that prehensile condition where a markedly convex palm or a produced thumb is relatively minute and *meets the base only*, of the dactyl. The description ‘‘minutely chelate’’ is obviously suitable only where the dactyl is small and fits against the tip of an equally small thumb.

### PROPHLIANTIDAE, fam. nov.

Body compressed or cylindrical, rostrum minute or absent. Eyes present. Peraeon strongly developed. Pleon segments 5 and 6 generally reduced or coalesced. Side plates generally shallow. Telson short, cleft or apically incised. Antennae short, without accessory flagellum. Mandible without palp, molar generally vestigial or wanting. Lower lip with or without inner lobes. Palp of maxilla 1 usually reduced or absent. Maxilliped generally with inner plate well developed. Gnathopod 1 and 2 subchelate, parachelate, or simple. Branchial lamellae small. Uropods 1 and 2 biramous, uropod 3 variable.

With eight genera and twelve species.

1. Body compressed, carinate, side plates deep . . . . . 2.  
    Body sub-cylindrical, side plates shallow . . . . . 4.
2. Fifth side plate very large, uropod 3 well developed, biramous.  
    *Prophlias* g. nov. (1).  
    Fifth side plate small, uropod 3 small, uniramous . . . . . 3.
3. Side plates 1–4 shallower than their related segments, maxilliped outer plate large, telson apically cleft . . . . . *Cleina* Della Valle (2).  
    Side plates 1–4 deeper than their related segments, maxilliped outer plate small, telson cleft almost to the base . . . . . *Kuria* Walker (3).
4. Telson apically incised or partly cleft, uropod 3 biramous.  
    *Biancolina* Della Valle (4).  
    Telson cleft to base, uropod 3 not biramous . . . . . 5.
5. Pleon segments 5–6 small but distinct . . . . . *Eophliantis* Sheard (5).  
    Pleon segments 4–6 coalesced . . . . . 6.
6. Pleopods biramous, uropod 3 uniramous.  
    Peraeon segment 1 without ventral flange . . . . . *Wandelia* Chevreux (6).  
    Peraeon segment 1 with ventral flange . . . . . *Bircenna* Chilton (7).  
    Pleopods uniramous, uropod 3 without distinct ramus.  
    *Cylindryllioides* Nicholls (8).

#### 1. *PROPHLIAS* gen. nov.

Integument hard, calcified; body robust, compressed, sub-carinate; head deep, with minute rostrum; eyes round; mouth parts prominent; side plates not quite

as deep as their related segments. Peraeon segments 4-7 and pleon segments 1-3 with postero-lateral corner produced into rounded tubercle, pleon segments 4-6 moderately well developed, but boundaries not distinctly indicated; telson deeply cleft. Antenna 1 short, stout, with large first segment; antenna 2 short, broad, flagellum wanting, the appendage carried flat upon the anterior surface of the head; labrum short, broad, entire; mandible with small molar on left appendage; lower lip with well-developed inner lobe; maxilla 1, inner plate small, one-segmented palp; maxilla 2, inner plate feeble, shorter than outer; maxilliped long, palp, 4-segmented, outer plate well developed, extending beyond second segment of palp, inner plate short, not reaching middle of first segment of palp.

Gnathopods slender, alike, subequal, subchelate, palm short, transverse, convex, dactyl short; peraeopod 3 has side plate, basos and meros greatly expanded, peraeopods 4 and 5 side plates relatively small, basos expanded; pleopods biramous, with peduncle relatively long and moderately produced mesially, two coupling hooks at postero-mesial angle; uropods biramous, 1-2 with long slender peduncle, rami short, unequal; uropod 3 peduncle stout, rami equal, stout and conical, rather longer than peduncle.

*Remarks.* This genus differs from all the others included in this family, excepting *Ceina* and *Kuria*, in its compressed condition and the degree of development of the side plates. Except, however, that it is compressed instead of depressed, it approaches the Phliantidae in its hard exoskeleton and deep side plates 1-4, and (apart from the unusual development of third peraeopod) recalls the *habitus* figure of *Phlius serratus* Guerin and *Heterophlius seclusus* Shoemaker.

There is likewise a remarkable resemblance to some members of that family in the antennae, but with the difference that it is the second antenna of *Prophtius* which is flattened and reduced. The first antennae arise close together near the middle line, separated only by the minute rostrum. The second are inserted more ventrally upon the anterior surface of the head, and are carried so flattened against that surface so that, in profile, they are difficult to recognize.

The pleopods, though modified, are less aberrant than in any other member of either the Prophliantidae (with the exception of *Ceina egregia*) or of the Phliantidae, while the urns and the uropods are little reduced. The third uropods, in particular, are almost normal; in size and proportions they come nearest to some of the Phliantidae, e.g. *Quasimodia barnardi* Sheard, where, however, only one stout ramus persists.

The expansion of the hinder peraeopods, also recalls the condition found in those flattened forms, but in *Prophtius* in peraeopod 3 it reaches an extreme development, and involves the side plate as well.

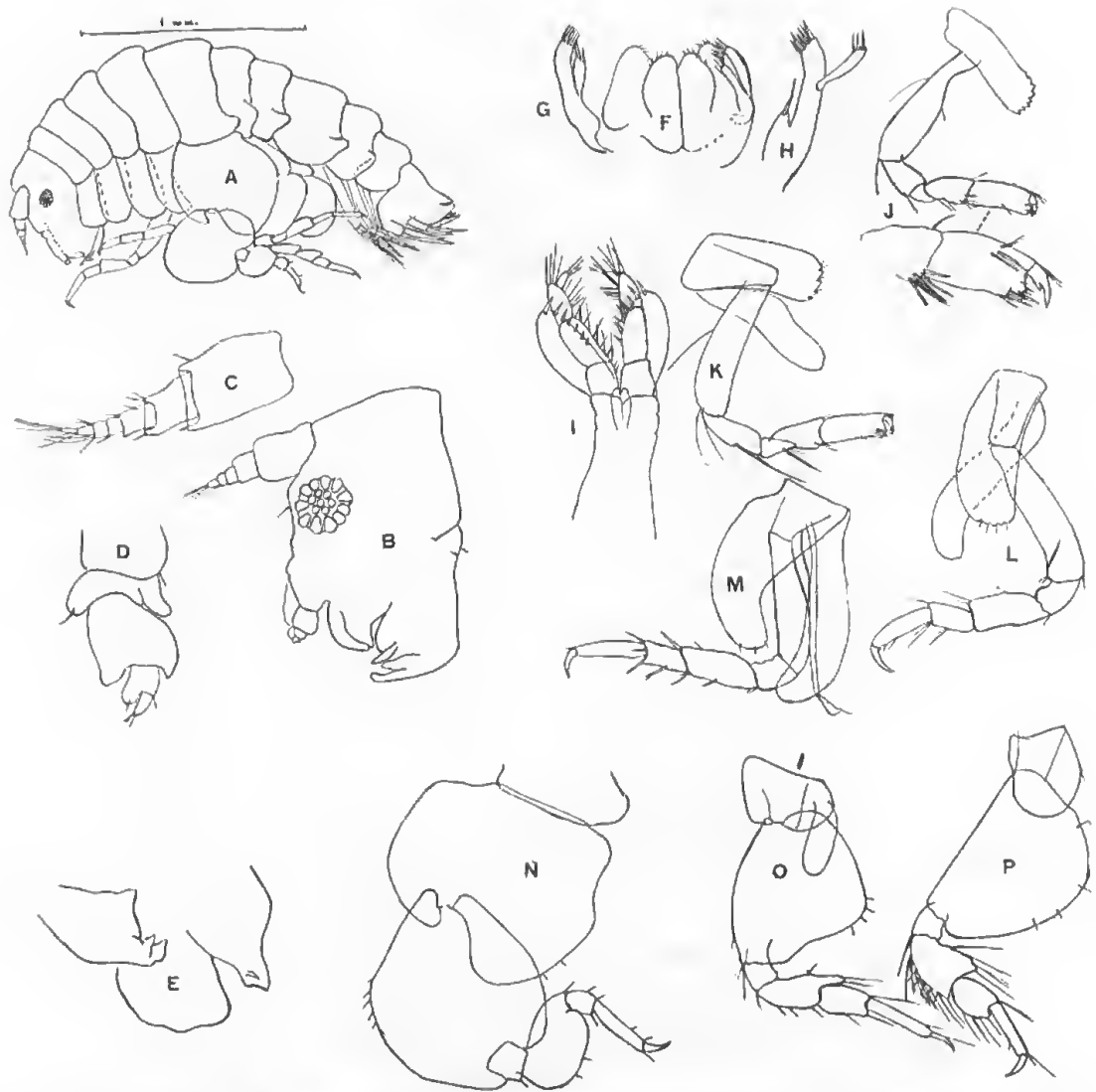


Fig. 1. *Prophlias anomalus*: A, ♀, lateral view; B, head (slightly flattened); C, antenna 1; D, antenna 2; E, labrum with both mandibles; F, lower lip with maxilla 2 still attached; G, maxilla 2 of opposite side; H, maxilla 1; I, maxilliped; J, gnathopod 1, with hand (enlarged) from another specimen; K, gnathopod 2; L, peracopod 1, with gill; M, peracopod 2 with gill and narrow brood lamella; N, O, P, peracopods 3, 4, and 5 (peracopod 4 with gill).

*PROPHLIAS ANOMALUS* sp. nov.

With the characters of the genus. A more detailed description of some of the appendages may be added.

*Female. Antenna 1.* First segment of peduncle very stout, second and third progressively shorter and more slender, flagellum 4-segmented with aesthetes on distal three segments. In *antenna 2*, only five segments were made out, the second with a well developed antennary cone, segments 1-4 flattened, the last short.

*Labrum* short and broad, with slightly sinuous free border.



The left *mandible* bears a reduced molar, its cutting edge apparently with two prominent teeth, the right with a small secondary cutting edge.

The *lower lip* is unusual in this family, with inner and outer lobes of almost equal size.

The *maxillae* seem to have undergone displacement: laterally occurs a pair of appendages, which I must suppose to be maxilla 1 with small inner plate armed with a single seta, while the moderately long palp appears unsegmented. Mesial, and adhering upon dissection to the lower lip, is the small maxilla 2, its inner plate, armed with few setae, shorter than the outer.

The *maxilliped* with very long basal segment, the distal (horizontal) portion bent upon the proximal almost at right angles, and consisting of a *relatively* short 4-segmented palp, the well developed outer plate armed mesially with spines, inner plate difficult to make out, but seemingly short and unarmed.

The side plates 1–3 increase progressively in length and depth, the ventral margins are notched, 2 and 3 bearing setae in the notches; 4 strongly emarginate behind, armed with a few setae. The gnathopods are unusual in this family (excepting *Ceina*) in that the propod is rather wide and the daetyl short, scarcely projecting beyond the short convex palm, thus producing a subchelate hand. It seems probable that the simple or the parachelate gnathopods found in most members of this family have arisen by reduction from an originally subchelate condition such as this. In the second gnathopod the ischium is particularly long, as in Lysianassids. Peraeopods differ from gnathopods in having the carpus linear and the propod narrow.

The third peraeopod is peculiar. The side plate is relatively immense, deeper than all the rest, rather longer than the combined length of side plates 1–4, and markedly bilobed. The basos is somewhat similar in shape and size, the meros broadly expanded. The limb appears to be partly retroverted (probably the distal 4 segments). Peraeopod 4 has basos expanded, narrowing rather abruptly towards its distal end; while the basos of 5 is more regularly convex behind, the fourth and fifth segments strongly spined. Small simple gills are borne on thoracic legs 2–6. The brood lamellae are long and strap-shaped (fig. 1 N).

The pleopods are biramous, the long peduncle being expanded mesially, two coupling hooks on inner distal angle. Uropod 1 longer than 2, inner ramus little more than half the length of outer; uropod 2 with peduncle slender, the linear rami subequal and shorter than peduncle, the inner ramus in both uropods 1 and 2 armed terminally with two setae and a stout spine, which may represent a second segment. Similar stout terminal spines are found in *Cylindryllioides*, *Bircenna*, *Eophliantis*, *Kuria*, and *Wandelia*. The third uropod has a short stout peduncle, the two rami stout, conical, equal and rather longer than peduncle.

The telson is cleft nearly to the base, each half tapering to a pointed extremity and armed with a single seta.

*Length.* From 1.5 mm.—3 mm. Eight examples were taken, Apr., 1939. Two large specimens dissected were both female—one with four embryos (0.3 mm. long). I cannot discern any difference which could be regarded as related to sex.

*Colour.* In spirit, pure white.

*Loc.* Rottnest, Western Australia. On west side of Bathurst Point, in fine sand and weed between large boulders where waves break continually. (Cotypes in South Australian Museum.)

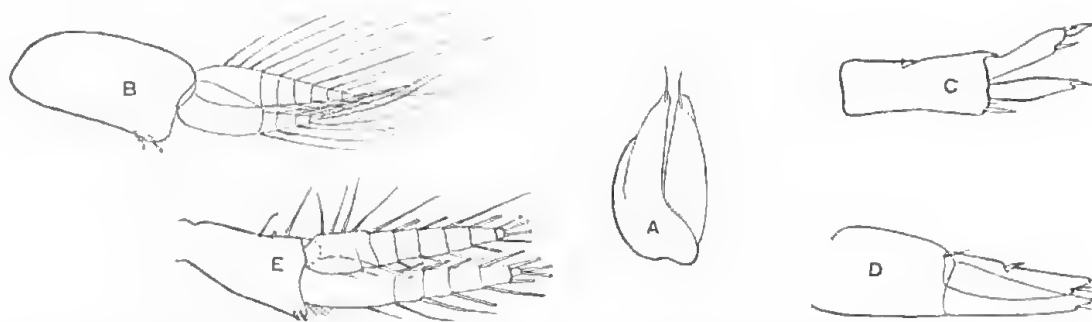


Fig. 2. A-D, *Prophlias anomalus*: A, telson; B, pleopod; C, D, uropods 1-3. E, *Ceina egregia* Chilton; pleopod.

## 2. CEINA Della Valle.

Della Valle, 1893; Stebbing, 1899 and 1906; Chilton, 1919; Pirlot, 1936 (*Periphlias*) and 1938.

Body carinate, moderately compressed, head small, not deep, without rostrum; eye small, red; peraeon segment 1 produced into "hood" overhanging the head, longer than second segment; pleon segments 4-6 reduced; telson apically cleft; side plates 1-4 less deep than related segments; side plate 5 bilobed, shallow.

Antennae short, slender, antenna 2 the longer; mandible with molar small, modified; lower lip with inner lobe slightly indicated; maxillipedes normal; gnathopods subchelate, gnathopod 2 (in male) chelate; uropods 1 and 2 biramous; uropod 3 uniramous.

*Remarks.* Just as this paper was practically completed, my attention was directed by Mr. Sheard to Pirlot's references to this genus, who kindly sent me a copy of that author's later paper. Pirlot's description (under the generic name *Periphlias*) of his species *carinatus* had suggested that the Amphipod in question was a fairly typical Philantid. In 1938 the genus *Ceina* is listed among the Talitridae, and the species *carinatus* sunk in *egregia*. The genus differs, so far as at present known, from all of the remaining members of this family, as well as from



all of the Phliantidae, in the condition of the second gnathopod of the male. That condition, however, differs, in degree only, from what I have called the parachelate, and, since several of the species here recorded are known from the female only, *Ccina* may prove not to be peculiar in this feature.

With one species.

#### CCINA EGREGIA Chilton.

Chilton, 1883, p. 77, pl. ii (*Nicca*); Della Valle, 1893, p. 530, pl. lviii, figs. 14–21; Stebbing, 1906, p. 54; Chilton, 1919, p. 120, figs. 1–25; ? Pirlot, 1936, p. 295, figs. 121–3, and 1938, pp. 329–30.

*Remarks.* Pirlot (l.c. p. 330) considers that, apart from the shape of the head (which he says Chilton has figured incorrectly), the discrepancies between his account and that of Chilton are to be attributed to the smaller size of his Siboga specimen.

While that may well be true of the antennae and perhaps of the mandible, the carpus of pereopod 5, and the dactyl of 4 and 5, it is rather unexpected to find changes (consequent on growth) such as those in side plates 1 and 4 or the meros of pereopods 3 and 4. In view of the fact that *C. egregia* has apparently a limited distribution in New Zealand, it seems quite possible that the Suln specimen will prove to belong to a distinct species.

#### 3. KURIA Walker.

Walker, 1903; Stebbing, 1906; Sheard, 1936.

Body compressed, head small, partly concealed by first side plate, without rostrum; side plates 1–4 deeper than their related segments; pleon segments 4–6 coalesced; telson divided almost to the base. Antennae subequal, short, few segmented. Mandible with dentate primary and secondary edges; molar rather large; maxilliped with both plates small, especially the outer. Gnathopods alike, slender, subequal, subchelate; pereopods 3–5 very robust; side plates moderate, basos and meros well expanded. Uropods 1 and 2 with peduncle shorter than the rami, which are equal and similar; uropod 3, the single ramus as long as peduncle.

*Remarks.* Of this genus, Walker remarks that it is very aberrant, but apparently most nearly related to *Bircenna* which, as he points out, “seems . . . out of place with genera such as *Percionotus*, *Iphinotus*, etc”.

The generic definition given by Walker has been somewhat amplified, additional characters being introduced for comparison with *Prophlias*, to which, much more than to *Bircenna*, does it show kinship. From *Bircenna* it differs most conspicuously in its compressed body and deep side plates, in both of which it resembles *Prophlias*.

With one species.

## KURIA LONGIMANA Walker.

Walker, 1903, p. 228, pl. xiv B, figs. 5-5n; Stebbing, 1906, p. 726; Chilton, 1909, p. 63; Sheard, 1936, pp. 457 and 463.

*Remarks.* It is of interest that while this species has so much in common with *P. anomalus*, it yet differs quite strikingly in numerous details; and one or the other may retain a less specialized condition in respect to any given character. Thus in *Kuria* the head appears less deep, the side plates deeper. Side plate 4 is large, excavate behind, principally dorsally; side plates 5, 6, and 7 are apparently small and alike, whereas in *Prophlias* side plate 4 is curved and slender (that is, greatly excavated), and side plate 5 is extraordinarily developed. In *Kuria* it is the basos of peracopod 5 which makes the largest contribution to the lateral shield, in *Prophlias* the basos of peracopod 3 is most developed. Uropod 3 is reduced in size and uniramous in *Kuria*, whereas in *P. anomalus* it is well developed and retains the more generalized equal biramous condition.

Similarly with the head appendages. *Kuria* shows both antennae unmodified except that they are small, and few segmented, the peduncle being scarcely distinguished from flagellar portion.

In *Prophlias* the second antenna is curiously modified, and so flattened down upon the head that under cursory inspection it appears absent. In the mouth parts the mandible is less reduced in *Kuria*, but *Prophlias anomalus* (alone of the members of this family in which the mouth parts are fully described) has the first maxilla moderately complete, and the lower lip well developed and bilobed, in which latter it is approached by the condition in *Biancolina*.

The maxilliped of *Kuria* shows the outer plate almost vestigial, whereas in *Prophlias* it is the inner plate which is very reduced.

In both species the ischium is unusually long in the gnathopods, and the hands more nearly retain the subchelate condition, although in *Kuria* the dactyl is shown extending well beyond the palm, approaching the condition for which I have proposed the term *parachelate*.

Notwithstanding these differences *Kuria* and *Prophlias* constitute a distinct group in this family remote from the more vermiform genera—*Biancolina*, perhaps, providing a link.

## 4. BIANCOLINA Della Valle.

Della Valle, 1893, p. 562; Stebbing, 1906, p. 646, part.

Body slightly compressed, peraeon strongly developed, segments subequal, pleon segments 4-6 not greatly reduced. Head longer than deep, as long as combined length of peraeon segments 1 and 2. Eye small, round, red. A moderately

well developed intersegmental region or "neck"; antenna 1 longer than antenna 2. Labrum wide, short, its anterior border slightly emarginate. Mandible with toothed cutting edge, without molar.

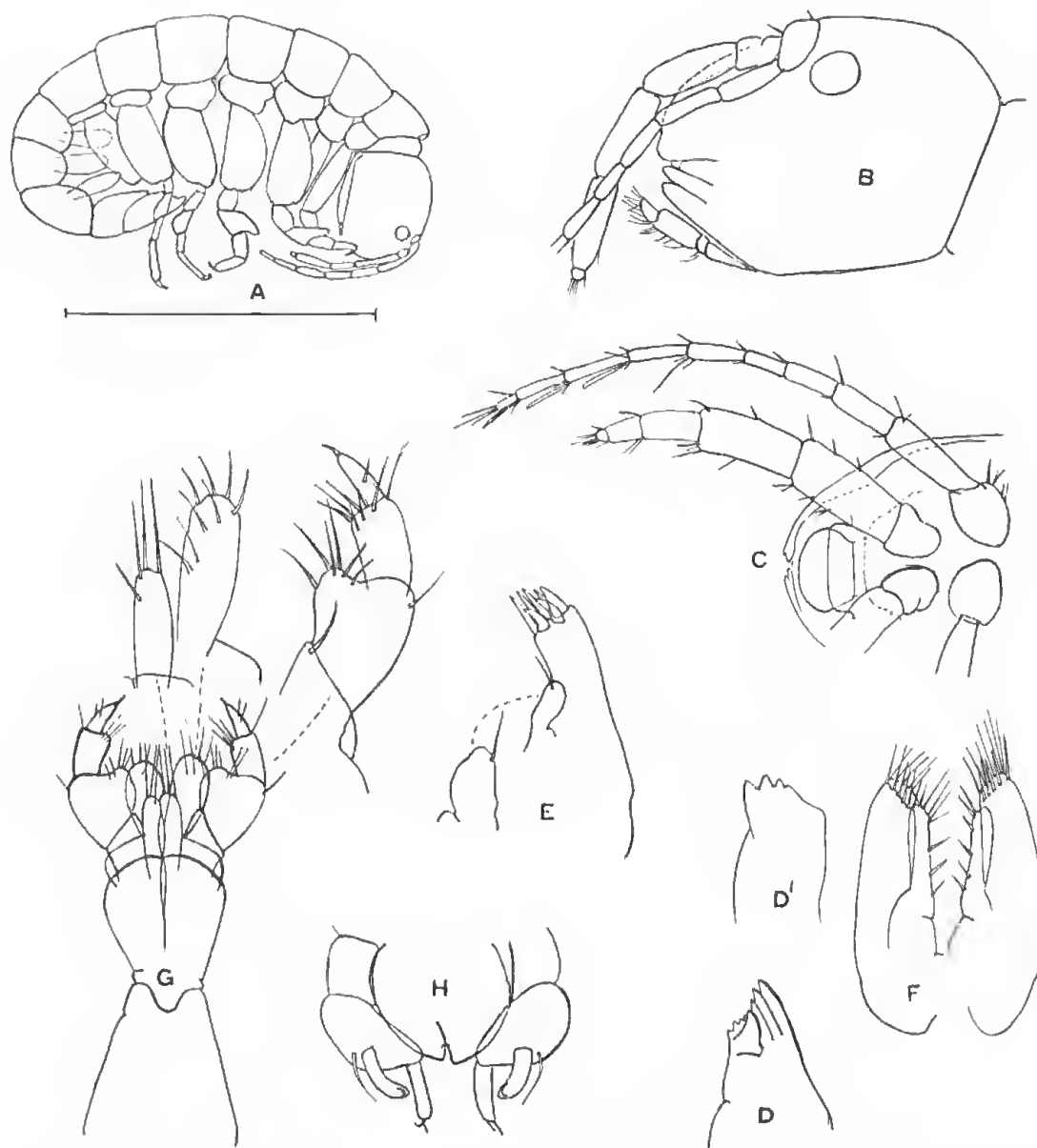


Fig. 3. *Biancolina australis*: A, ♀, lateral view; B, head; C, head, antero-dorsal view, showing insertion of antennae, and labrum with an overlying plate which from its position can scarcely be a rostrum, but may be an epistome; D, D', mandibles; E, maxilla 1, with inner plate from opposite side; F, maxilla 2; G, maxilliped, with plates and palp more highly magnified; H, telson and uropod 3.

Lower lip with large inner lobe; maxilla 1 without palp, inner plate small with single seta; maxilla 2 small, inner plate slender with few terminal setae, and others scattered along its mesial border. Maxilliped with small inner plate, palp three- or four-segmented.

*Remarks.* Apparently known from two specimens only, probably female, 1.5 mm. in length. Bright yellow in colour. Taken in water less than 1 m. in depth in the Bay of Naples.

## BIANCOLINA AUSTRALIS sp. nov.

Integument parchment-like. Body slender, sub-cylindrical. Head rounded, longer than deep. Eye small, round. Peraeon well developed, first segment not longer than second, side plates shallow, scarcely touching, pleon downturned, segments distinct, urus not extremely reduced, telson cleft at apex.

Antennae arising close to middle line on antero-dorsal surface of the head. Antenna 1 slender with rounded basal segment, remaining segments without differentiation into peduncle and flagellum, linear, 10 segments, with setae and with

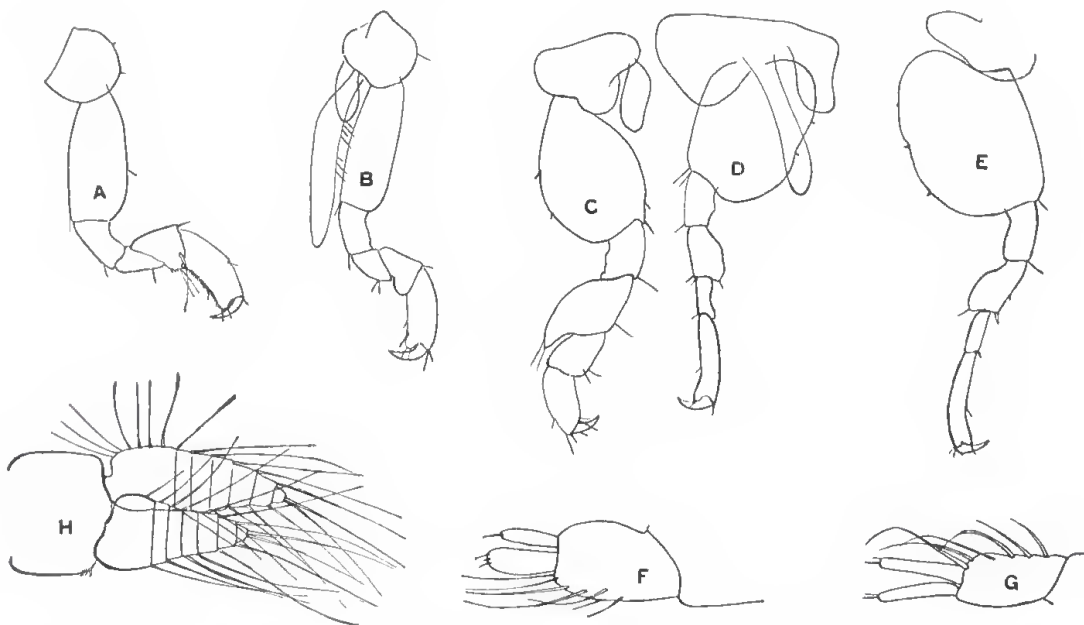


Fig. 4. *Biancolina australis*: A, gnathopod 1; B, gnathopod 2; C, D, and E, peracopods 2, 3 and 4; F, G, uropods 1 and 2; H, pleopod.

aesthetes on 7, 8, 9. Antenna 2 stouter and shorter than antenna 1, only five distinct segments, with scattered setae, the last segment minute. Labrum wide and shallow, its free border faintly emarginate.

Mandibles exactly as in *algiticola*: lower lip not seen; maxilla 1, with small inner plate armed with single seta, outer plate stout, with about seven stout spine teeth, palp wanting. Maxilla 2 and maxilliped agreeing with those of *algiticola*, except that the appendages of *australis* are apparently slightly more setose, and that the palp is four-segmented (Della Valle shows but three, perhaps overlooking a basal segment). Gnathopods nearly alike, the hand rather closely resembling that of *Bircenna* (*B. nichollsi* and gnathopod 2 of *B. ignea*), the dactyl overlapping considerably the short convex palm. The carpus, however, is shorter and

more triangular in outline, as in *Prophlias*. In gnathopod 1 the hinder border of carpus and propod is armed with close-set setae, appearing denticulate.

Peraeopods 1 and 2, short and stout, with sub-oval basos and wide decurrent meros; peraeopods 3-5 longer and more slender, basos uniformly expanded with few crenations and setae, meros less widened, carpus distinctly narrowed, propod long and curved, and with the dactyl apparently prehensile on a minute palm. Short simple gills on thoracic legs 2-5, brood lamellae wider than in *Prophlias*. The pleopods biramous, wide peduncle with three coupling books, the rami being so broad that the expansion of the peduncle is less obvious.

Uropods biramous; uropod 1, peduncle wide, longer than rami, inner ramus more slender and slightly shorter than outer; uropod 2, peduncle shorter and narrower than in uropod 1, subequal to rami, which are slender and equal. In both uropod 1 and 2 the outer aspect is set with long plumose setae more numerous than in *algicola*. Uropod 3 lamellar with two equal slender rami and one long seta. The inner ramus is straight, and bears two terminal setae; the outer is curved, its apex upturned, and bears a terminal hooked spine.

Size. Length as figured, 1.3 mm. Female, four embryos.

Colour (in spirit) pale yellowish-green.

Loc. Rottnest, Western Australia. West of Bathurst Point, in sand and weed among boulders with waves breaking continually. Collected Apr., 1939.

Remarks. The likeness to *algicola* is astonishingly close, and in size the two species also agree. Of the Prophliantidae, this genus has undergone least modification of the pleopods and least reduction of urns and uropods. In its external form its shallow side plates, its antennae, mouth parts, gnathopods, etc., it has attained the condition typical of the family.

##### 5. EOPHLIANTIS Sheard.

Peraeon strongly developed (sub-cylindrical). Head almost spherical, separated by well-marked neck from the first peraeon segment, which is little longer than second, without sternal flange. Side plates shallow. Pleon segments 4-6 distinct. Telson small, upturned, cleft to base. Antennae short, slender, subequal, the first slightly longer; molar present on right mandible; maxilla 1 with palp vestigial; gnathopods simple, 1 moderately slender, 2 longer and more slender, with distal end of propod produced into slight tooth; peraeopods 3-5 with basos broadly produced, peraeopod 5 the longest; pleopods biramous, 2-3 with peduncle widely expanded. Uropods 1 and 2 biramous, uropod 3 a very small bilobed structure.<sup>(1)</sup>

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(1) Mr. Sheard informs me that a re-examination of the type confirms his original description of this appendage as "biramous".



*Remarks.* Very near to *Wandelia*, from which it is distinguished by relative shortness of first peraeon segment, the shallowness of the side plates, the simple gnathopods, the expanded peduncles of pleopods 2 and 3, and the condition of the third uropod.

With one species.

*EOPHLIANTIS TINDALEI* Sheard.

Sheard, 1936, p. 457, figs. 1-2.

*Remarks.* Through the kindness of Mr. K. Sheard I have been able to examine a cotype of this species.

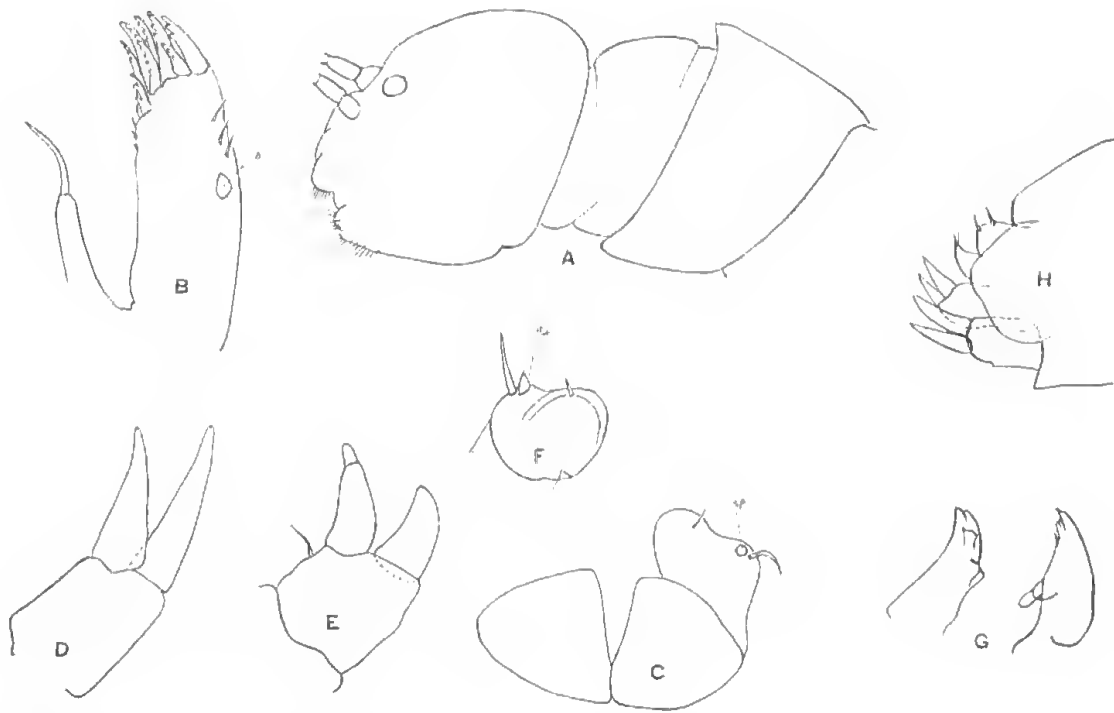


Fig. 5. A-F, *Eophlantis tindalei* Sheard: A, head and peraeon segment 1, lateral view; B, maxilla 1; C, telson with uropod 3 in position, in dorsal view; D, E, uropods 1 and 2; F, uropod 3 dissected out. G-H, *Wandelia crassipes* Chevreux G, mandibles; H, urus in side view.

In the first maxilla I find the palp represented by a vestige only (fig. 5 B). Mr. Sheard, to whom I have referred this point, has examined further material, and, in a recent letter, states that he is able to confirm this. Further, in the very small specimen (possibly very immature) which I have examined, the two lobes of uropod 3 are not separate from the peduncle. The species may prove to be less distinct from *Wandelia crassipes* than has been supposed, and a study of more abundant material render it necessary to transfer this species to *Wandelia*. Judging from

Sheard's figures, there seems to be a small difference in the first and second uropods of male and female, the first pair in the female and the second in the male being the longer.

#### 6. WANDELIA Chevreux.

Body robust, sub-cylindrical; head without rostrum. Eye small, oval. First peraeon segment much longer than second, its sternite not produced into ventral flange. Pleon segments 4-6 reduced. Telson cleft to the base.

Antennae short, slender, sub-equal, the second slightly the longer; upper lip with margin entire, rounded; mandible with vestigial molar; first maxilla without palp; maxilla 2 with outer plate longer than inner; maxilliped with inner plate longer than outer, palp 4-segmented.

Gnathopods alike, slender; ischium long, propod produced into a small tooth; peraeopods short and stout; 3-5 with basos expanded; pleopods biramous, with peduncle only moderately widened; uropods 1 and 2 biramous, 3 with single ramus incompletely marked off from peduncle.

With two species.

Head sub-globular, gnathopods long and slender, peraeopods 3-5 with carpus linear .. .. .	<i>crassipes</i> .
Head longer than deep, gnathopods short, peraeopods 3-5 with carpus expanded and decurrent .. .. .	<i>japonensis</i> .

#### WANDELIA CRASSIPES Chevreux.

Chevreux, 1906, p. 45, figs. 24-6; Chilton, 1909 (*Bircenna crassipes*), p. 59; Chevreux, 1913 (*B. crassipes*), pp. 113-4; Sheard, 1936, p. 460 (*B. crassipes*).

*Remarks.* This species differs from *Bircenna* spp. chiefly in the absence of the sternal flange on the first peraeon segment. Other differences are found in the gnathopods and pleopods. In the second, figured by Chevreux, the peduncle is shown having a width one-and-a-half times as great as the length. In preparations made <sup>(2)</sup> by Chilton, one of the pleopods, probably the first, shows the peduncle only as wide as long. In *Bircenna*, as noted below, all of the pleopods have the peduncle expanded, the width being twice the length. In *Prophlias*, as already stated, the more usual Amphipodan condition is found with length of peduncle greater than width, although some widening is evident. In every case, however, the expansion is mesial, so that the rami of any pair of pleopods tend to be more widely removed, and the peduncles to come into contact.

(2) In one particular this specimen appears to differ from that described by Chevreux. The partly dissected head shows the two mandibles still attached. The left is as figured by Chevreux but the right *seems* to have a prominence representing the molar.

The third uropod is said by Chevreux to possess a short peduncle from which the lamellar ramus is not distinctly separated, whereas in *Bircenna fulva*, according to Chilton (1909), the third uropod consists in but a single bifid segment.

*WANDELIA JAPONENSIS* sp. nov.

*Description.* ♀. Body robust, sub-cylindrical; head longer than deep; eye small, oval; first pereon segment considerably longer than second; side plates very shallow, widely separated, telson appearing oblong, with corners rounded, cleft to the base.

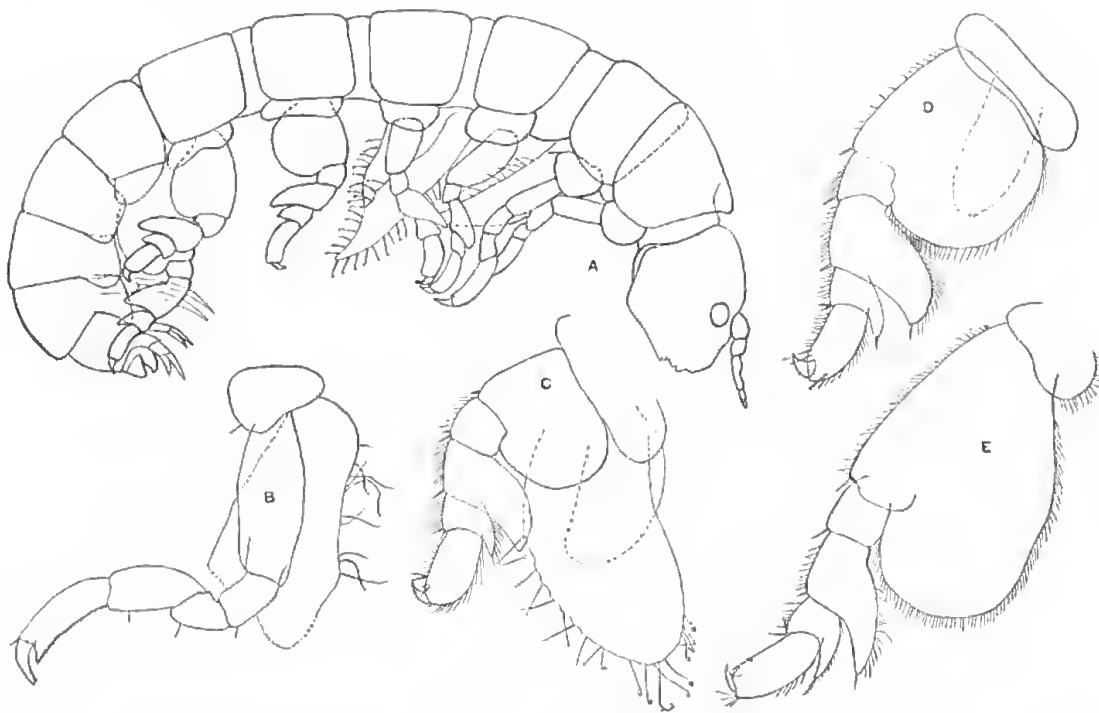


Fig. 6. *Wandelia japonensis*: A, lateral view (♀); B, gnathopod 2; C-E, pereopods 3-5.

Antennae short, sub-equal; antenna 1 with six segments, aesthetes on the last two; antenna 2, also with six segments, slightly longer and stouter than antenna 1; upper lip, mandibles, maxillae, and maxillipeds as in *crassipes* except that the inner plate of maxilla 1 appears to bear but a single seta.

Gnathopods alike, parachelate; less slender and relatively shorter than in *crassipes*, ischia not unusually long, propod in gnathopod 1 minutely denticulate, its distal end produced into blunt tooth-like prominence. Pereopods robust; 1 and 2 with basos oval, 3-5 with basos expanded, but the hinder border not erenate, the carpus as well as the meros expanded and decurrent; most of the segments fringed with setae.

Pleopods, with peduncle comparatively little expanded mesially, most noticeably in pleopod 3, which is shortest; in 1 and 2 there is a marked production of the peduncle distally along the mesial edge of the inner ramus.

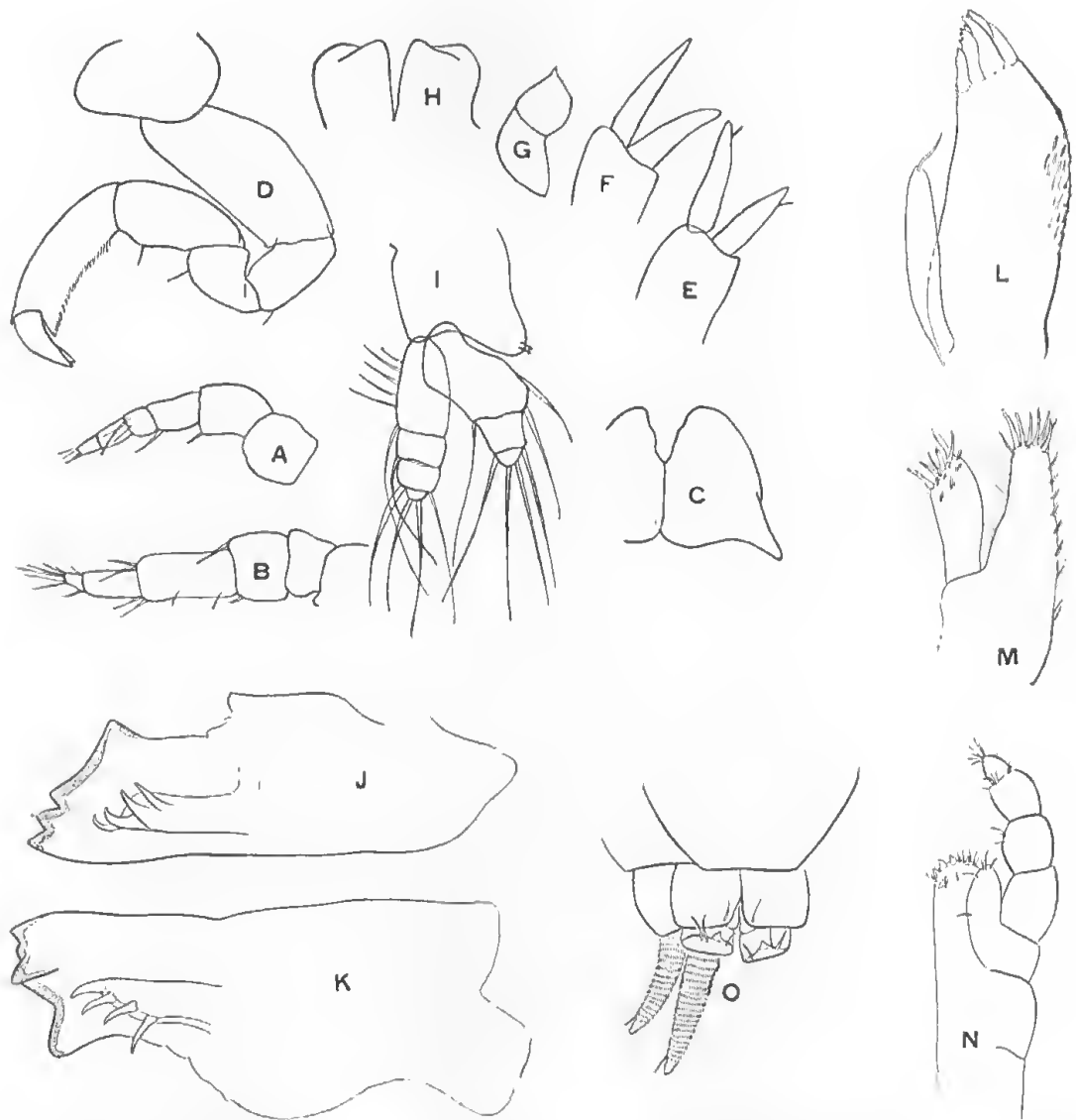


Fig. 7. A-I, *Wandelia japonensis*: A-B, antennae 1 and 2; C, lower lip; D, gnathopod 1; E-G, uropods 1-3; H, telson; I, pleopod 3. J-O, *Wandelia japonensis* (Chilton's figs.): J-K, mandibles; L-M, maxillae 1 and 2; N, half maxilliped; O, uropod 2, uropod 3, telson.

Uropods 1 and 2 alike, sub-equal, 3 with ramus indistinct (?).

Size: 3.5 mm. Three ♀♀, two with fully-developed brood pouch.

Loc. Otaru, Hokkaido, Japan. Coll. Dr. Hatta, "From the Medulla of *Undaria*".

*Remarks.* These specimens form part of Dr. Chilton's collection of Amphipoda, and seem not to have been described. They were labelled *Bircenna japonensis* n. sp., but lack, however, the flange on the first peraeon segment, which is characteristic of *Bircenna*. From *Wandelia crassipes* they differ most noticeably in the long *Caprella*-like head (*crassipes* apparently agreeing with *Eoprhiantis tindalei* in having the head sub-globular), in the shorter and stouter gnathopods, and in the oval basos of peraeopods 1 and 2. The long first peraeon segment is found in both *crassipes* and *japonensis*. The mouth parts and peraeopods are strikingly like those of *crassipes* excepting that more of the joints are widened and decurrent, and many are abundantly fringed with setae, which is unusual in this family.

Of interest is the occurrence of a short tendril-like twisting at the ends of many of the setae of the brood lamella. In the specimen dissected, so firmly were the lamellae linked by this device that they would more readily tear than separate. A similar twisting of these setae has been observed in *Ccina egregia*, *Bircenna ignea*, *Cylindryllioides mawsoni*, and in a new and undescribed Western Australian species of *Quasimodia*. In *Prophlias*, setae were wanting from most lamellae, but when present they show a slight apical twisting. It will probably prove to be of general occurrence in both the Prophliantidae and the Phliantidae.

Since writing the above notes, Mr. Sheard has informed me that he has obtained, through the courtesy of the Canterbury University Museum, New Zealand, manuscript and drawings of the late Professor Chilton referring to this species. These notes and drawings, which were made from a relatively fresh specimen, substantially agree with my own observations.

With regard to the mouthparts, uropod 3, and telson, Chilton states: "The first maxilla has no sign of a palp, the outer lobe is strong with tufts of setae near the middle of the outer margin and about 6 or 7 stout, dentate teeth at the extremity; the inner lobe is slender, slightly more than half as long as the outer, and ends in a single fine setae.

"The second maxilla has the two lobes of about the same size, the setae at the extremity of both lobes are rather stouter than usual in this appendage; the outer lobe has also several tufts of fine setae on its outer margin and a fringe of fine setae on its inner margin.

"The mandibles are slender, entirely without palp, and there is no molar tubercle; the cutting edge is broad, formed of three or four teeth, one larger than the others and triangular; the accessory process is small, and in each mandible ends in four very sharp curved teeth. The third uropod consists of a single piece which may represent the peduncle and ramus combined. The extremity curves upwards, and is shown in the figure as bent back on its more proximal portion; it

ends in a short sub-acute tooth, with two setae on its outer side and one on its inner. The telson appears cleft to the base, each half is rectangular, and bears a fine seta at the inner distal angle."

Chilton's figures of these parts are reproduced (fig. 6, P-U).

Mr. Sheard has called my attention, also, to the fact that Stephensen (Trans. Sapporo Nat. Hist. Soc., Vol. 13, 1933) had published a description of a new Japanese Amphipod very probably from the same locality as *W. japonensis*, which he named *Ceinina japonica*. This was said to be taken on brown algae, and was referred by Stephensen to the Talitridae.

It seems probable that, like *Ceina*, it should also be assigned to the Prophliantidae, but I am unable to determine this, as no copy of Stephensen's paper is available to me.

It is, of course, a possibility that it may prove to be identical with the species here referred to *Wandelia*. As set out, above, this species differs in several details from *W. crassipes*, but these differences seem scarcely sufficient to warrant the establishment of a new genus.

#### 7. BIRGENNA Chilton.

Body sub-cylindrical; head large, sub-spherical, without rostrum; eyes small, round or oval. First pereon segment longer than second; its sternite ventrally produced into a deep, curved transverse flange, the concavity forwardly directed. Pleon segments 4-6 greatly reduced. Telson cleft to the base.

Antennae short, slender, sub-equal, the first slightly larger; mandible with molar weak or wanting; first maxilla without palp; maxilliped with palp four-segmented; gnathopods short, moderately stout, parachelate or imperfectly subchelate; pereopods 3-5 with bases expanded; pleopods biramous, with peduncles broadly produced mesially; uropods 1 and 2 biramous, 3 with single ramus incompletely indicated.

With three species.

- |   |    |    |    |    |    |                    |
|---|----|----|----|----|----|--------------------|
| 1. Molar wanting on mandible  | .. | .. | .. | .. | .. | <i>fulva</i> .     |
| Weak molar present on both mandibles                                  | .. | .. | .. | .. | .. | 2.                 |
| 2. Antennae slender, pereopods 3-5 scarcely longer than depth of body |    |    |    |    |    | <i>nicholtsi</i> . |
| Antennae stout, pereopods 3-5 longer than depth of body               | .. | .. | .. | .. | .. | <i>ignea</i> .     |

#### BIRGENNA FULVA Chilton.

Chilton, 1883 (*B. fulvus*), p. 264, pl. xxi, fig. 1; 1909 (*B. fulva*), p. 59, figs. 1-3; Stebbing, 1889 (*B. fulvus*), p. 421, and 1906, p. 205; Sheard, 1936, p. 460, fig. 3.



*Remarks.* The rather scanty figures of this species given by Chilton have been supplemented by Sheard in a number of drawings made from preparations of a syntype. The figure (3 E) of maxilla 1 is, in my opinion, the complete appendage, otherwise it is difficult to reconcile with the condition of this appendage in the two remaining species of this genus, which appear in other respects very closely akin to *fulva*. It seems probable that the third member (fig. 3 G) is the detached outer plate of maxilla 2.

Chilton's *habitus* figure (1883, fig. 1) fails to show the greater length of the first peraeon segment on which, too, the ventral sternal flange is quite well developed.

*BIRCENNA NICHOLLSI* Sheard.

Sheard, 1936, p. 461, fig. 4.

*Remarks.* Since 1936, when the first specimen (an ovigerous ♀) of this species was collected, numerous other examples have come to light not only from Sellick Reef but also from other localities in St. Vincent Gulf.

♂ ♂ are perhaps represented in the collection, but if so, differences between the sexes must be very slight, appearing only in gnathopods and uropods. So far as the gnathopods are concerned small differences, which I take to be related to sex, are seen in propod and dactyl, the former stouter and the dactyl shorter in the presumed male. In uropod 1 the inner ramus is the more slender, and is longer than the peduncle; uropod 2 shows the inequality of the rami more markedly; but these may prove to be merely individual variations. In uropod 3 the small conical ramus is very incompletely separated from the peduncular region, and in side view the appendage has the appearance of being bilobed. Pleopods 1 and 3 exhibit that projection at the proximal end of the outer margin of the inner ramus, to which Chilton has called attention in *fulva* (1909, fig. 1).

*BIRCENNA IGNEA* sp. nov.

*Description.* Body sub-cylindrical, rather short and stout; head nearly globular, more massive in the ♂; eye small, nearly round, with few ocelli (17–20), peraeon strongly developed, peraeon segment 1 much longer than 2; side plates very shallow; pleon segments 4–6 greatly reduced; telson completely cleft, the apices broadly rounded.

Antennae sub-equal, short, antenna 1 of ♀ with seven segments, all but the last of the four flagellar segments with aesthetes, antenna 2 slightly stouter, with six distinct segments; in the ♂ the antennae are markedly stouter, antenna 1 flagellum with five segments, four bearing bushy tufts of aesthetes. Upper lip

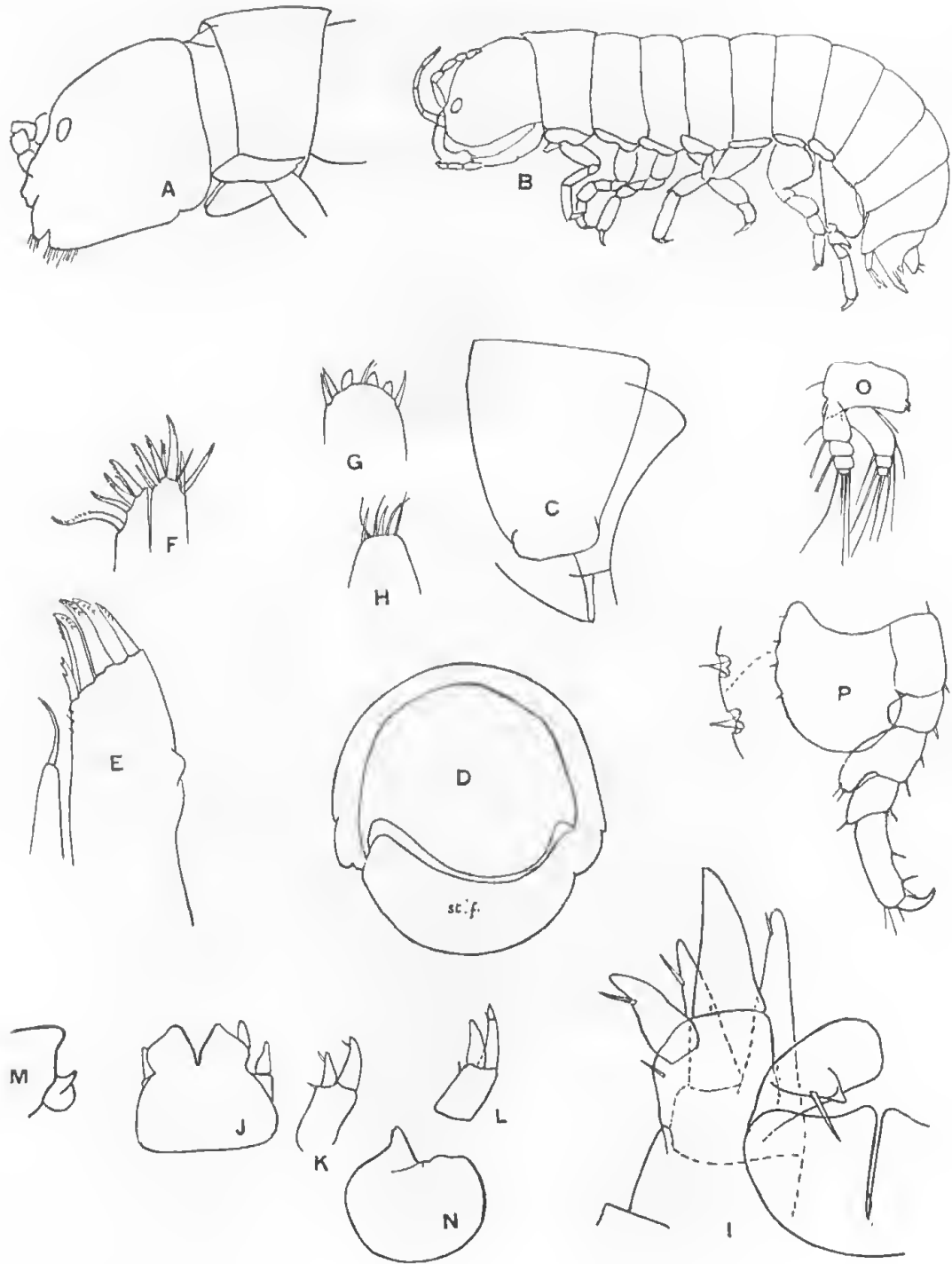


Fig. 8. A, *Bircenna fulva*: head and peraeon segment 1, lateral view. B-P, *Bircenna nichollsi* Sheard: B, entire animal, lateral view; C, peraeon segment 1, from the side, and D, from the front; E, maxilla 1; F, distal part of maxilla 2; G, H, inner and outer plates of maxilliped; I, urus and uropods from above; J, the same partly dissected and somewhat flattened; K, L, uropods 2 and 1; M, uropod 3, lateral view; N, the same removed and more highly magnified; O, pleopod 3; P, peracopod 5, with part of hinder border of basos enlarged.

rounded, wider than deep. Mandible with molar weak, primary edge not definitely toothed, minute secondary cutting edge with three slender teeth. Lower lip without inner lobes, rounded apices of outer lobes with setules; maxilla 1 with vestige of palp, inner plate with single seta reaching almost as far distally as the spines on outer plate; maxilla 2, with plates sub-equal, inner plate much less ob-

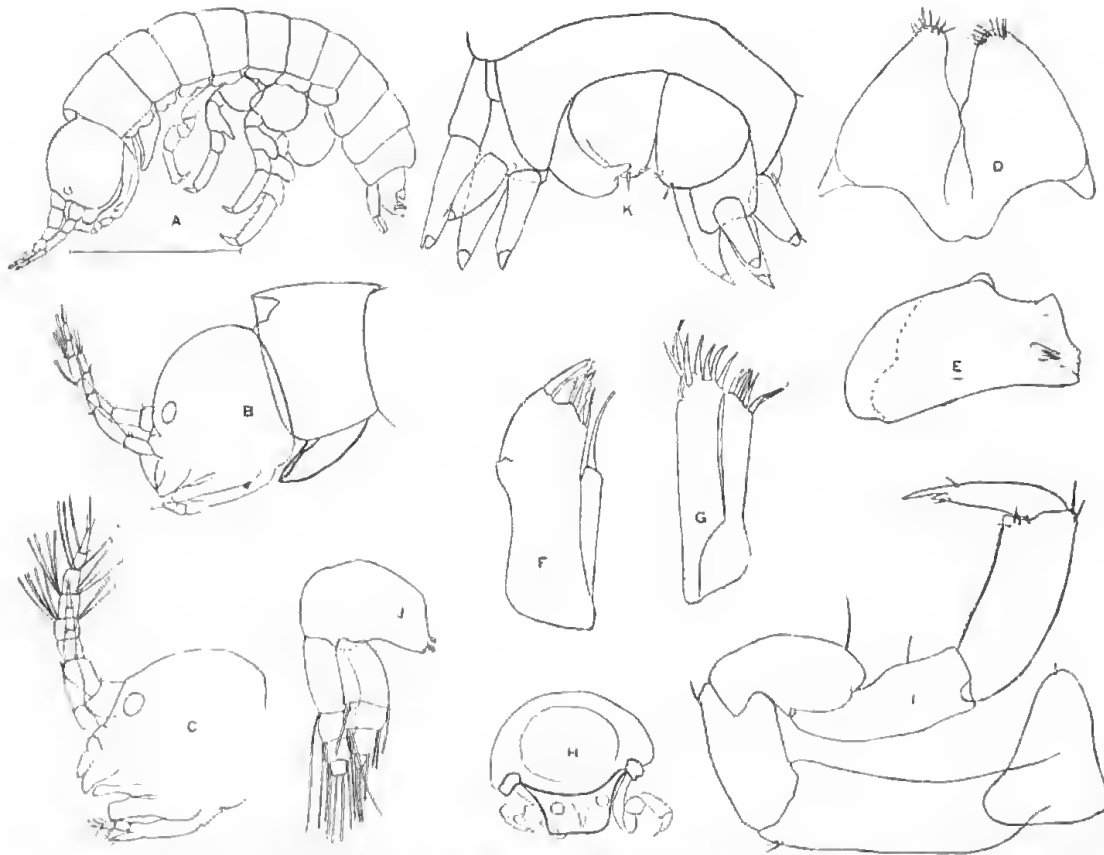


Fig. 9. *Bircenna ignea*: A, lateral view; B, head, with peraeon segment 1 (♀); C, head (♂); D, lower lip; E, mandible; F-G, maxillae 1 and 2; H, front view of peraeon segment 1; I, gnathopod 1; J, pleopod 3; K, urus, in dorsal view, uropod 3 removed from one side.

liquely truncate than in *nichollsi*. Maxilliped with outer plate armed with setae along its inner border, shorter than inner plate.

The sternite of the first peraeon segment downwardly produced, the curved plate showing a paired circular perforation (or perhaps merely thin transparent area).

Gnathopods alike, minutely parachelate, slender, gnathopod 1 carpus as long as propod, the latter with minute palm, slender dactyl as long as hinder border of propod; gnathopod 2 with dactyl about three-fourths of length of propod. Peraeopods stout, peraeopod 1 with postero-distal angle of propod produced into strong

tooth, approaching the condition figured by Sheard for gnathopod 2 of *fulva* (1936, fig. 3R); peraeopods 4 and 5, expansion on hinder border of basos with but a single notch and seta. Uropods 1 and 2 stout, rami subequal and longer than peduncles, each bearing stout terminal spine; uropod 3, short lamellar with single small conical ramus. Apices of telson each bearing a seta and a spinule.

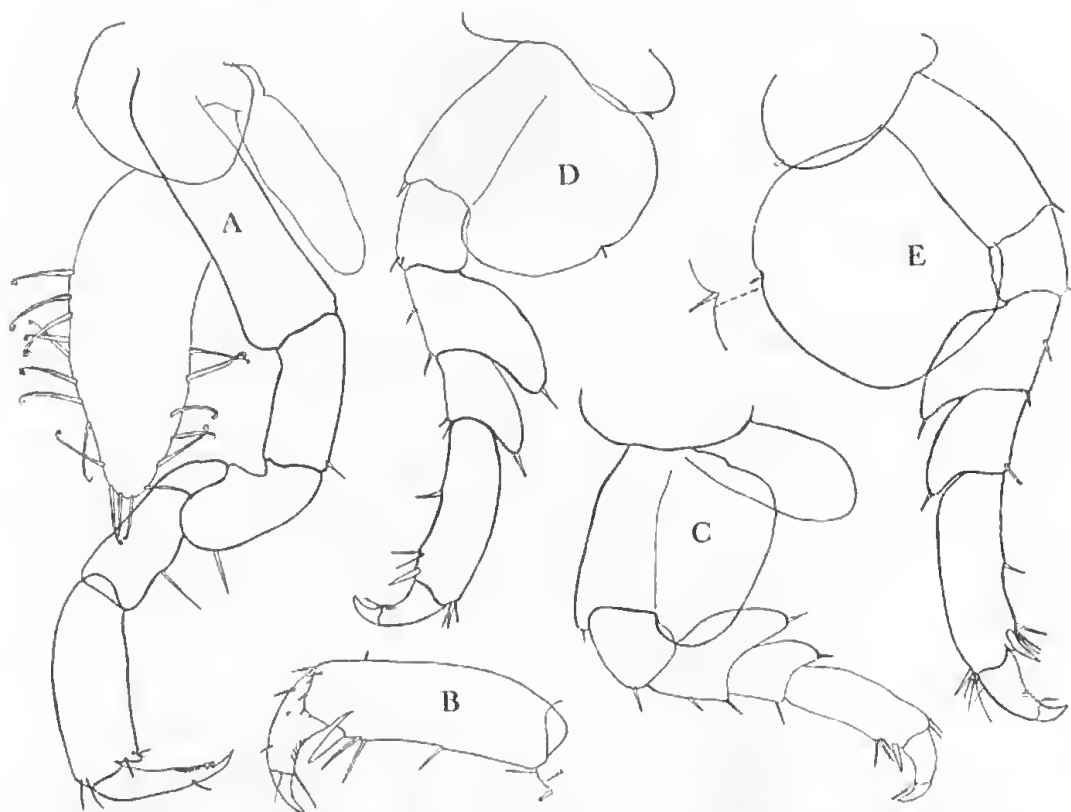


Fig. 10. *Bircenna ignea*: A, gnathopod 2; B, propod and dactyl, peraeopod 1; C-E, peraeopods 3-5.

*Length*: 1.5 mm.-2 mm.

*Colour*. A fiery red.

*Loc*. Amongst fine seaweed and sand; nearly a dozen specimens, including four ♂♂, taken in November, 1938, Shelly Beach, Nornalup, South-western Australia.

*Remarks*. All three species of this genus are very closely alike. From *nichollsi*, *ignea* may be distinguished by the lesser depth of its peraeon segments and the greater relative length of the hinder peraeopods. The expansion of the basos of these peraeopods (3-5) is greater in *nichollsi*, although the legs are actually shorter. There is a difference in the shape of the head of these two species. The antennae are distinctly stouter in *ignea*, the only species in which sex distinctions affecting the antennae have been seen. The eyes are larger, but seem to have

fewer ocelli, which are black on a red pigmented ground. In *nichollsi* the ocelli are difficult to make out, but they appear to be more numerous and, in preserved specimens, quite black; the colour in life of this species is not recorded.

CYLINDRYLLIOIDES Nicholls.

Nicholls, 1938.

Body slender, sub-cylindrical. Head longer than deep, without rostrum, with sub-ocular incisure (?), and in the relaxed condition separated from the first peraeon segment by a wide intersegmental region or "neck". Peraeon long, first segment slightly longer than the second, and without ventral sternal projection. Side plates short and very shallow, widely separated. Metasome well developed, but pleon segments 4-6 greatly reduced without definite intersegmental boundaries. Telson minute, deeply cleft.

Antennae short, stout, subequal, 2 the shorter; upper lip rounded, with shallow median emargination; reduced molar on left (?) mandible; lower lip without inner lobes; maxilla 1 without palp; maxilla 2 plates sub-equal; maxilliped with short stout four-segmented palp, inner and outer plates sub-equal. Gnathopod 1 shorter than 2, otherwise alike, slender, parachelate; peraeopods short, stout, bases expanded in 3-5; pleopods with short peduncle, the single slender ramus with few segments; uropods 1 and 2 biramous, rami sub-equal, 3 peduncle lamellar, without rami.

With one species.

CYLINDRYLLIOIDES MAWSONI Nicholls.

Nicholls, 1938, p. 59, figs. 30, 31.

*Remarks.* Of all of the species of this family, this has attained most nearly to the vermiform condition.

The side plates are extremely reduced and widely spaced, the urus quite minute, and the pleopods with but a single ramus, the peduncle small and scarcely widened.

Taken at Macquarie Island, by H. Hamilton, in 1913.

With the exclusion, from the Phliantidae, of *Bircenna*, *Wandelia*, and *Kuria*, the remaining genera constitute a more coherent family, which may be defined as follows:

PHLIANTIDAE Stebbing.

Body depressed; peraeon side plates expanded. Pleon strongly flexed ventrally, subject to degradation. Antennae 1 and 2 very short. Antenna 1 with

peduncle expanded, no accessory flagellum. Upper lip with distal margin usually undivided. Lower lip with or without inner lobes. Mandible without palp. Maxilla 1 without inner lobe, palp absent or one-jointed, small. Maxilliped with palp variable. Gnathopods 1 and 2 simple or subchelate.<sup>(3)</sup> One or more pleopods with peduncle expanded. Pleopod 3 with inner ramus subject to degradation. Uropod 3 usually not biramous. Telson short, entire, not upturned.

With 10 genera, 13 species, including a new and as yet undescribed *Quasimodia* species from Western Australia.

These are all to be readily recognized by their broadly depressed body, short entire telson, and wide side plates.

Rather similar side plates are met with in the more compressed Prophliantidae, and in *Biancolina* the telson is almost entire. In the mouthparts the families are sharply separated by the condition of the first maxilla, and, in both, parallel degeneration has occurred in one or more of the parts and of the pleopods—perhaps consequences of similar habitat and mode of life.

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(3) Mr. Sheard informs me that the word “sub” was omitted between the words “weakly” and “chelate” in his definition of the sub-family *Phliantinae* (Sheard, 1936, p. 463).